

## HIGH-DENSITY PACKAGING OF INTEGRATED CIRCUITS

### Abstract

An integrated circuit constructed on a folded integrated circuit is described. The folded integrated circuit has a much smaller form-factor than the original (unfolded) circuit and is thus more suitable for use in miniature devices, such as, for example, electronic camera, electronic-film cartridge, cellular telephone, handheld computer, handheld digital music device, portable devices, handheld devices, and the like. In one embodiment, the integrated circuit is folded by thinning an area of the substrate such that the thinned area of the substrate becomes flexible. Conducting traces on the upper surface of the substrate connect an active region on one side of the thinned area to an active region on the other side of the thinned area. The substrate is folded at the thinned area to thereby reduce the size of the substrate. In one embodiment, a heat-sink is inserted between the folds to carry heat away from the substrate.

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